

Since 1999



# NEET 2023-24

|             |              |                            |   |
|-------------|--------------|----------------------------|---|
| Mark<br>720 | Group<br>PCB | <b>PRE FINAL ROUND -02</b> | Date : 19/03/2024<br>Time : 3 :20 Hours |
|-------------|--------------|----------------------------|---|

## Answer Key Version - S (PCB NEET 2023-24 )

| Physics      |       |       |               |       | Chemistry    |       |       |               |        |
|--------------|-------|-------|---------------|-------|--------------|-------|-------|---------------|--------|
| <b>Sec.A</b> | 11. 4 | 22. 1 | 33. 2         | 43. 2 | <b>Sec.A</b> | 61. 4 | 72. 2 | 83. 2         | 93. 2  |
| 01. 3        | 12. 1 | 23. 4 | 34. 2         | 44. 1 | 51. 3        | 62. 1 | 73. 2 | 84. 1         | 94. 1  |
| 02. 2        | 13. 4 | 24. 3 | 35. 3         | 45. 3 | 52. 1        | 63. 1 | 74. 4 | 85. 3         | 95. 1  |
| 03. 2        | 14. 2 | 25. 2 | <b>Sec. B</b> | 46. 3 | 53. 2        | 64. 3 | 75. 2 | <b>Sec. B</b> | 96. 2  |
| 04. 2        | 15. 2 | 26. 2 | 36. 2         | 47. 1 | 54. 1        | 65. 4 | 76. 4 | 86. 4         | 97. 2  |
| 05. 3        | 16. 1 | 27. 4 | 37. 4         | 48. 4 | 55. 2        | 66. 4 | 77. 2 | 87. 1         | 98. 4  |
| 06. 1        | 17. 1 | 28. 2 | 38. 1         | 49. 3 | 56. 2        | 67. 2 | 78. 2 | 88. 1         | 99. 2  |
| 07. 1        | 18. 3 | 29. 1 | 39. 2         | 50. 1 | 57. 4        | 68. 2 | 79. 2 | 89. 3         | 100. 1 |
| 08. 1        | 19. 3 | 30. 2 | 40. 1         |       | 58. 1        | 69. 4 | 80. 4 | 90. 1         |        |
| 09. 2        | 20. 3 | 31. 3 | 41. 1         |       | 59. 2        | 70. 1 | 81. 3 | 91. 3         |        |
| 10. 2        | 21. 3 | 32. 4 | 42. 1         |       | 60. 2        | 71. 1 | 82. 4 | 92. 2         |        |

## Biology

| Biology                 |        |        |              |        |                          |        |        |               |        |
|-------------------------|--------|--------|--------------|--------|--------------------------|--------|--------|---------------|--------|
| <b>Part-I<br/>Sec.A</b> | 110. 4 | 121. 1 | 132. 4       | 142. 1 | <b>Part-II<br/>Sec.A</b> | 160. 2 | 171. 2 | 182. 1        | 192. 1 |
|                         | 111. 3 | 122. 1 | 133. 3       | 143. 2 |                          | 161. 2 | 172. 4 | 183. 2        | 193. 3 |
| 101. 4                  | 112. 2 | 123. 1 | 134. 3       | 144. 3 | 151. 4                   | 162. 2 | 173. 3 | 184. 1        | 194. 4 |
| 102. 4                  | 113. 2 | 124. 2 | 135. 3       | 145. 3 | 152. 4                   | 163. 1 | 174. 1 | 185. 1        | 195. 2 |
| 103. 3                  | 114. 4 | 125. 4 | <b>Sec.B</b> | 146. 2 | 153. 3                   | 164. 3 | 175. 1 | <b>Sec. B</b> | 196. 2 |
| 104. 4                  | 115. 4 | 126. 2 | 136. 3       | 147. 3 | 154. 3                   | 165. 2 | 176. 3 | 186. 4        | 197. 2 |
| 105. 4                  | 116. 4 | 127. 4 | 137. 2       | 148. 4 | 155. 3                   | 166. 4 | 177. 2 | 187. 2        | 198. 4 |
| 106. 3                  | 117. 2 | 128. 2 | 138. 4       | 149. 1 | 156. 4                   | 167. 1 | 178. 4 | 188. 3        | 199. 1 |
| 107. 1                  | 118. 2 | 129. 3 | 139. 4       | 150. 4 | 157. 3                   | 168. 2 | 179. 2 | 189. 2        | 200. 2 |
| 108. 3                  | 119. 2 | 130. 2 | 140. 1       |        | 158. 1                   | 169. 2 | 180. 2 | 190. 2        |        |
| 109. 2                  | 120. 4 | 131. 2 | 141. 4       |        | 159. 4                   | 170. 2 | 181. 2 | 191. 3        |        |

# PHYSICS

## SECTION - A (35 Questions)

01. (3)  $(I_1\omega_1 + I_2\omega_2) = (I_1 + I_2)\omega'$

$$\omega' = \frac{I_1\omega_1 + I_2\omega_2}{(I_1 + I_2)} \quad K_f = \frac{1}{2}(I_1 + I_2)\omega'^2$$

$$= \frac{(I_1\omega_1 + I_2\omega_2)^2}{2(I_1 + I_2)}$$

02. (2)

03. (2)  $v_{rms} = \sqrt{\frac{3RT}{M_0}} \quad v_{rms}^2 = \frac{3RT}{M_0}$

$$v_{rms}^2 \propto T$$

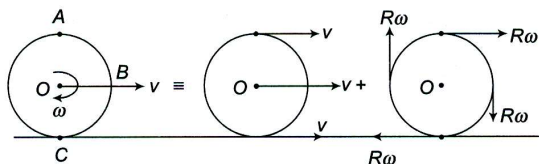
The graph between  $v_{rms}^2$  v/s  $T$  is straight line, through origin

04. (2)  $I = \frac{m(2L)^2}{12} = \frac{mL^2}{3}$

$$\tau \Delta t = \Delta L = I \Delta \omega$$

$$\tau t = \frac{mL^2}{3}(\omega - 0) \Rightarrow \tau = \frac{mL^2\omega}{3t}$$

05. (3) When a body rolls without slipping, the velocity of any point of the body is resultant of two velocities; one due to pure translational motion and another due to pure rotational motion. Also,  $v = r\omega$ .



$$v_A = v + R\omega = v + v = 2v$$

$$v_B = \sqrt{v^2 + (r\omega)^2} = \sqrt{2}v$$

$$v_C = v - v = 0$$

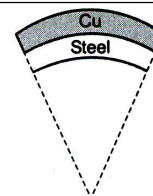
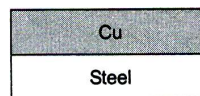
06. (1)  $a = \frac{g \sin \theta}{1 + k^2/R^2} = \frac{g \sin \theta}{1 + \frac{mk^2}{mR^2}} = \frac{g \sin \theta}{1 + \frac{I}{mR^2}}$

07. (1)

08. (1)  $\frac{x}{5} = \frac{x-32}{9} \Rightarrow 9x = 5x - 160$

$$x = -40$$

09. (2) Increase in length of copper will be greater than steel ( $\alpha_c > \alpha_s$ )



10. (2) When a body is heated, the distance between any two points on it increase.

11. (4)

$$\frac{1}{2}\alpha\Delta\theta \times 86400 = \frac{1}{2} \times 11 \times 10^{-6} (35 - 25) \times 86400$$

$$= 4.75 \text{ s}$$

12. (1)  $\overline{v^2} = \frac{v_1^2 + v_2^2 + v_3^2 + v_4^2}{N}$

$$= \frac{(2)^2 + (3)^2 + (4)^2 + (5)^2}{4} = 27/2$$

$$v_{rms} = \sqrt{\overline{v^2}} = \sqrt{\frac{27}{2}} \text{ km/s}$$

13. (4)  $P = \frac{1}{3} \frac{M}{V} v_{rms}^2 = \frac{1}{3} \rho v_{rms}^2 = \frac{1}{3} \rho \cdot \frac{3RT}{M_0}$

14. (2)  $n_1 = 1, \gamma_1 = 5/3, n_2 = 1, \gamma_2 = 7/5$

$$\frac{n_1 + n_2}{\gamma - 1} = \frac{n_1}{\gamma_1 - 1} + \frac{n_2}{\gamma_2 - 1}$$

$$\frac{1+1}{\gamma-1} = \frac{1}{\frac{5}{3}-1} + \frac{1}{\frac{7}{5}-1} \quad \frac{2}{\gamma-1} = \frac{3}{2} + \frac{5}{2} = 4$$

$$\overline{\gamma} = \frac{3}{2} = 1.5$$

15. (2)  $\lambda \propto 1/P$

When mean free path is doubled, pressure becomes half

16. (1)  $mL_v + ms_w(100 - 0) = M_{ice} \times S_{ice}(10) + M_{ice} \times L_s$

$$M \times 540 + M \times 100 = 64 \times \frac{1}{2} \times 10 + 64 \times 80$$

$$640 \text{ m} = 320 + 5120$$

$$M = \frac{5440}{640} = 8.5 \text{ gm}$$

17. (1)

18. (3)  $\gamma = \frac{C_p}{C_v} = \frac{R \left( \frac{f}{2} + 1 \right)}{\frac{f}{2} R} = 1 + \frac{2}{f}$

19. (3)  $\frac{C_p}{C_v} = \gamma, C_p - C_v = R$

$$C_V = \frac{R}{\gamma - 1}, C_P = C_V + R = \frac{\gamma R}{\gamma - 1}$$

$$S_P = \frac{C_P}{M} = \frac{\gamma R}{M(\gamma - 1)}$$

20. (3)  $\Delta W_{\text{cyclic}} = -\pi \left( \frac{P_2 - P_1}{2} \right) \left( \frac{V_2 - V_1}{2} \right)$   
 $= -\frac{\pi}{4} (P_2 - P_1)(V_2 - V_1)$

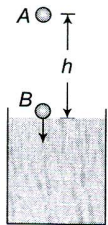
21. (3) In adiabatic process,  $\Delta Q = 0$

$$\Delta S = \frac{\Delta Q}{T} = 0$$

22. (1)  $W = U = \frac{1}{2} \frac{AY\Delta L}{L} \Delta L$   
 $= \frac{1}{2} \times \frac{1 \times 10^{-6} \times 2 \times 10^{11}}{1} \times (10^{-3})^2 = 0.1 \text{ J}$

23. (4)  $100 \times s_w (50 - \theta) = 10 L_{\text{ice}} + 10 \times 1 \times (\theta - 0)$   
 $100 \times 1(50 - \theta) = 10 \times 80 + 10\theta$   
 $5000 - 100\theta = 800 + 10\theta$   
 $1100 = 4200 \quad \theta = 38.2^\circ\text{C}$

24. (3)



$$v_T = \frac{2(\rho - \sigma)r^2 g}{9\eta} \quad \sigma = 1 \text{ g/cc, } v_T = v$$

$$v_T = v = \sqrt{2gh} = \frac{2(\rho - 1)r^2 g}{9\eta}$$

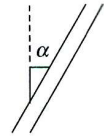
$$2h = \frac{4(\rho - 1)^2 r^4 g}{81\eta^2} \quad h = \frac{2(\rho - 1)^2 r^4 g}{81\eta^2}$$

$$= \frac{2}{81} r^4 \left( \frac{\rho - 1}{\eta} \right)^2 g$$

25. (2) Higher value of  $\gamma$ , curve is more steeper  
 For monoatomic gas,  $\gamma_1 = 1.67$ , for diatomic gas  
 $\gamma_2 = 1.4$   
 $\gamma_1 > \gamma_2$  i.e., curve 2  $\rightarrow$  monoatomic gas  
 curve 1  $\rightarrow$  diatomic gas

26. (2)

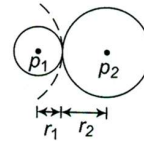
$$h' = \frac{h}{\cos \alpha} = \frac{10}{\cos 45} = 10\sqrt{2} \text{ cm}$$



27. (4)

$n = 10^3, \Delta W = -146 \times 10^3 \text{ J}, \Delta T = T_2 - T_1 = 7^\circ\text{C}$   
 $\Delta W = \frac{nR(T_1 - T_2)}{\gamma - 1} = -\frac{nR(T_2 - T_1)}{\gamma - 1}$   
 $-146 \times 10^3 = -\frac{10^3 \times 8.3 \times 7}{\gamma - 1}$   
 $\gamma - 1 = 0.4 \quad \gamma = 1.4, \text{ diatomic gas}$

28. (2)



$$p_1 - p_0 = \frac{4S}{r_1} \quad (i), \quad p_2 - p_0 = \frac{4S}{r_2} \quad (ii)$$

(i) - (ii)  $\Rightarrow p_1 - p_2 = \frac{4S}{r}$   
 $\frac{4S}{r_1} - \frac{4S}{r_2} = \frac{4S}{r} \Rightarrow \frac{r_2 - r_1}{r_1 r_2} = \frac{1}{r} \Rightarrow r = \frac{r_1 r_2}{r_2 - r_1}$

29. (1)

$$\frac{\Delta V}{V} = \gamma \Delta \theta \quad \frac{0.12}{100} = 3\alpha \quad (20)$$

$$\alpha = \frac{0.12}{100 \times 60} = 2 \times 10^{-5} / ^\circ\text{C}$$

30. (2)

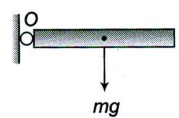
31. (3)  $V_1 = V_0, V_2 = 8V_0, P_1 = (H + h)m$  of water  
 $P_2 = H$   
 $P_1 V_1 = P_2 V_2$   
 $(H + h)V_0 = H \cdot 8V_0 \quad h = 7H$

32. (4)  $I = I_0 + Md^2$

$I$  v/s  $d$  graph:  $y = I_0 + Mx^2$  (parabola, open upward)

33. (2)  $\tau_0 = mg \frac{L}{2} = I_0 \alpha = \frac{mL^2}{3} \alpha$

$$\alpha = \frac{3g}{2L}$$



34. (2)  $L_1 = L, L_2 = 3L$

$$\frac{K_2}{K_1} = 9, \left( \frac{K_2}{K_1} - 1 \right) \times 100 = 800\%$$

35. (3)  $\Delta Q = \Delta U + \Delta W = nC_V \Delta T + nR \Delta T$

$$= n \cdot \frac{3R}{2} \cdot \Delta T + nR\Delta T \quad Q = \frac{5nR\Delta T}{2}$$

$$nR\Delta T = \frac{2Q}{5} = \Delta W$$

**SECTION - B (Attempt Any 10 Questions)**

36. (2)  
 37. (4) In an elastic collision both the momentum and kinetic energy remains conserved. But this rule is not for individual bodies, but for the system of bodies before and after the collision. While collision in which there occurs some loss of kinetic energy is called inelastic collision. Collision in daily life is generally inelastic. The collision is said to be perfectly inelastic, if two bodies stick to each other.

38. (1) Mass  $\propto$  area  
 $m_1$  : mass of small disc

$$\frac{m_1}{9M} = \frac{\pi(R/3)^2}{\pi R^2} \Rightarrow m_1 = M$$

M.I. of a circular disc of radius  $R$  and mass  $9M$  about the required axis

$$I_1 = \frac{1}{2} \times 9MR^2 = \frac{9MR^2}{2}$$

M.I. of a small disc about the same axis

$$I_2 = \left[ \frac{1}{2} M \left( \frac{R}{3} \right)^2 + M \left( \frac{2R}{3} \right)^2 \right] = \frac{1}{2} MR^2$$

M.I. of the remaining disc is

$$I_1 - I_2 = 4MR^2$$

39. (2)  $T_1 = 27 + 273 = 300$  K,

$$V_1 = V, V_2 = \frac{8}{27} V, T_2 = ?$$

$$T_1 V_1^{\gamma-1} = T_2 V_2^{\gamma-1}$$

$$T_2 = T_1 \left( \frac{V_1}{V_2} \right)^{\gamma-1} = (300) \left( \frac{V}{\frac{8}{27} V} \right)^{\frac{5}{3}-1} = (300) \left( \frac{27}{8} \right)^{\frac{2}{3}}$$

$$= (300) \left[ \left( \frac{3}{2} \right)^3 \right]^{\frac{2}{3}} = (300) \left( \frac{3}{2} \right)^2$$

$$= 300 \times \frac{9}{4} = 675 \text{ K}$$

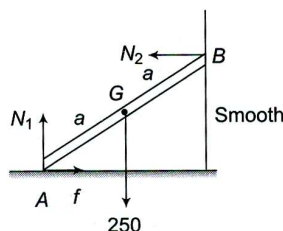
$$\Delta T = T_2 - T_1 = 675 - 300 = 375 \text{ K} = 375^\circ \text{C}$$

40. (1)  $\frac{1}{2} m v^2 (1 + k^2/R^2) = mgh$

$$\frac{1}{2} m v^2 \left( 1 + \frac{2}{5} \right) = mgh \quad \frac{7}{10} m v^2 = mgh$$

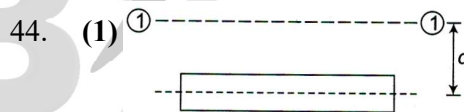
$$v = \frac{\sqrt{10gh}}{7} \quad v \geq \sqrt{\frac{10gh}{7}}$$

41. (1) Temperature of liquid oxygen will first increase in the same phase. Then, the liquid oxygen will change to gaseous phase during which temperature will remain constant. After that temperature of oxygen in gaseous state will increase. Hence option (1) represents corresponding temperature-time graph.



42. (1)  $\uparrow: N_1 = 250 \text{ N}$   
 $f_{\max} = \mu N_1 = 0.3 \times 250 = 75 \text{ N}$

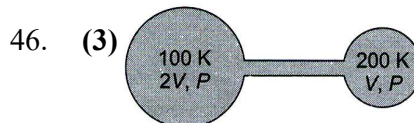
43. (2)



$I_{1-1} = 0 + Md^2$   
 Due to change in temperature, no effect on  $M$  and  $d$ , hence. M.I. remains same.

45. (3) From  $t = 0$  to  $t = 1$  min

$$\Delta Q = ms\Delta\theta = \frac{50}{1000} \times 0.6 \times 1000 \times (50 \times 0) = 1500 \text{ cal}$$



$$P \cdot 2V = \frac{m}{M_0} R(100) \tag{i}$$

$$P \cdot V = \frac{m'}{M_0} R(200) \tag{ii}$$

$$(i)/(ii) \quad 2 = \frac{m}{m'} \frac{100}{200}$$

$$m' = m/4$$

47. (1)  $\Delta W_{\text{cycle}} = -(2P - P)(3V - V) = -2PV$

Cycle is anticlockwise on  $P$ - $V$  diagram. Hence, work done is -ve.

- $\Delta Q_{\text{cycle}} = \Delta W_{\text{cycle}} = -2PV$   
Heat rejected in cycle  $ABCD = 2PV$
48. (4) (i) Clockwise cycle on  $P-V$  diagram  
 $\Delta W_{\text{cyclic}} = +ve = \Delta Q_{\text{cyclic}}$   
Heat is absorbed  
(ii) anticlockwise cycle on  $V-P$  diagram  
 $\Delta W_{\text{cyclic}} = +ve = \Delta Q_{\text{cyclic}}$   
heat is absorbed  
(iii) Clockwise cycle on  $P-V$  diagram  
 $\Delta W_{\text{cyclic}} = +ve = \Delta Q_{\text{cyclic}}$   
heat is absorbed  
(iv) clockwise cycle on  $V-P$  diagram  
 $\Delta W_{\text{cyclic}} = -ve = \Delta Q_{\text{cyclic}}$   
heat is rejected
49. (3) Substance expand on heating and contract on cooling
50. (1)

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## CHEMISTRY

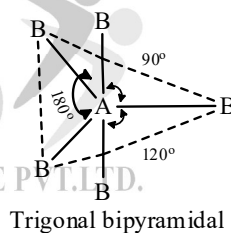
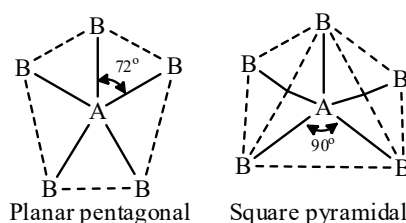
### SECTION - A (35 Questions)

51. (3)  $y - x$
52. (1)  $\text{Cl}_2\text{O}_7 > \text{SO}_3 > \text{P}_4\text{O}_{10}$
53. (2) 

|     |   |    |   |
|-----|---|----|---|
| (2) | p | 13 | 7 |
|-----|---|----|---|

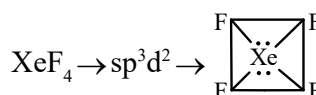
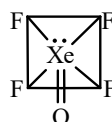
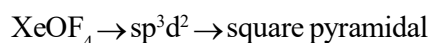
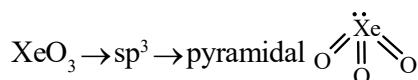
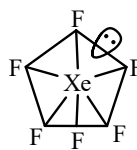
 (7s<sup>2</sup>, 7p<sup>1</sup>)
54. (1)  $\text{B.O.} \propto \frac{1}{\text{B.L.}}$ ; CO    CO<sub>2</sub>    CO<sub>3</sub><sup>2-</sup>  
B.O.    3.0    2.0     $\frac{4}{3}$
55. (2) In (b), octet rule is followed for all atoms.
56. (2)  $\text{CH}_3\text{-CH}_2\text{-COONa} \xrightarrow{\text{Electrolysis}} \text{CH}_3\text{CH}_2\text{CH}_2\text{-CH}_3$
57. (4)  $\text{CH} \equiv \text{CH} \xrightarrow{\text{Hg}^{2+}/\text{H}^+} \text{CH}_3\text{-CHO}$
58. (1)
59. (2)
60. (2)  $\text{SnCl}_4$  is most covalent, hence, lowest M.P.
61. (4)  $\text{Be}_2 \Rightarrow$  Because according to MOT bond order is zero.

62. (1) Geometrical isomers
63. (1) If both Assertion & Reason are true and the Reason is the correct explanation of the Assertion
64. (3) As the electrolyte paste is having ammonium chloride and zinc chloride and not KOH.
65. (4) As we know  $\text{H}^+/\text{H}_2$  couple has zero standard reduction potential so, ions having positive  $E^\circ$  value are weaker reducing agent, while ions having negative  $E^\circ$  value are stronger reducing agent.
66. (4) For  $\text{AB}_5$  molecules, there are three possible geometries i.e., planar pentagonal, square pyramidal and trigonal bipyramidal.

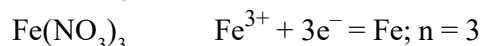
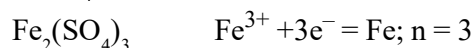
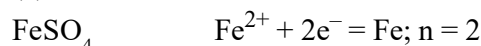


Out of these three geometries, it is only trigonal pyramidal shape in which bond pair-bond pair repulsions are minimum and hence this geometry is the most probable geometry of  $\text{AB}_5$  molecule.

67. (2)  $\text{XeF}_6 \rightarrow \text{sp}^3\text{d}^3 \rightarrow$  distorted octahedral



68. (2) Electrode reaction for :



Mass of Fe deposited (m) by the current (I) passed for 't' seconds is given by

$$m = \frac{M}{nF} I.t \quad \text{or} \quad m \propto \frac{M}{n}$$

$$\frac{\text{Mass of Fe deposited in FeSO}_4}{\text{Mass of Fe deposited in Fe}_2(\text{SO}_4)_3}$$

$$= \frac{M/2}{M/3} = \frac{3}{2}$$

$$\frac{\text{Mass of Fe deposited in Fe}(\text{NO}_3)_3}{\text{Mass of Fe deposited in FeSO}_4}$$

$$= \frac{M/3}{M/2} = \frac{2}{3}$$

$$\frac{\text{Mass of Fe deposited in Fe}_2(\text{SO}_4)_3}{\text{Mass of Fe deposited in FeCl}_3}$$

$$= \frac{M/3}{M/3} = 1$$

69. (4) 1-iii, 2-iv, 3-i, 4-ii

70. (1) a-ii, b-i, c-iv, d-iii

71. (1)  $\text{Na}^+ > \text{Li}^+ > \text{Mg}^{2+} > \text{Be}^{2+}$

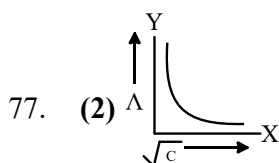
72. (2)  $1s^2, 2s^2, 2p^6, 3s^2 3p^1$

73. (2)  $\text{XeOF}_4$  has 5 b.p. and 1 l.p. Similarly,  $\text{IF}_5$

74. (4) all of these

75. (2) (ii) > (i) > (iii)

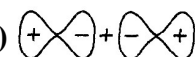
76. (4) It follows  $(4n)\pi$  Rule.



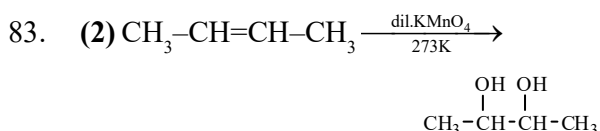
78. (2)  $E_{\text{Fe}^{2+}/\text{Fe}^{3+}}^0$ , is positive in alkaline medium, hence it is easier to oxidise  $\text{Fe}^{2+}$  to  $\text{Fe}^{3+}$  in alkaline medium.

79. (2) All isoelectronic ions belong to same period of the periodic table.

80. (4)  $\text{N} > \text{C} > \text{P} > \text{Si}$

81. (3) 

82. (4) None of these



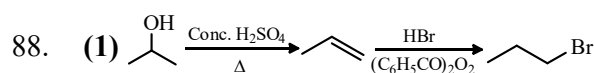
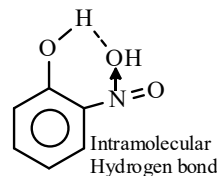
84. (1)  $\text{E}^+$  is  $\text{NO}_2^+$

85. (3) 0.7 V

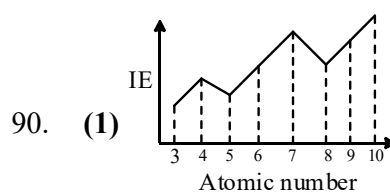
### SECTION - B (Attempt Any 10 Questions)

86. (4)  $\text{Cl} > \text{S} > \text{P} > \text{N}$

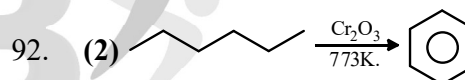
87. (1) Most volatile compound is due to intramolecular hydrogen bond.



89. (3) 1.1

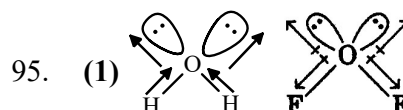


91. (3)  $\mu_{\text{SO}_3} = 0, \mu_{\text{SO}_2} \neq 0$



93. (2) 1 and 3

94. (1) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for THE Statement-1



96. (2) (2) & (3) only

97. (2) If both Assertion & Reason are true but the Reason is not the correct explanation of the Assertion

98. (4) 

|     |                |   |
|-----|----------------|---|
| (4) | Polarity order | $\text{N-H} < \text{Sb-H} < \text{As-H} < \text{P-H}$ |
|-----|----------------|---|

99. (2) 

|     |                      |             |            |
|-----|----------------------|-------------|------------|
| (2) | Trigonal bipyramidal | tetrahedral | octahedral |
|-----|----------------------|-------------|------------|

